Statewide High-Occupancy Vehicle (HOV) Issues

The following is a discussion of the specific issues that were raised concerning the operations of high-occupancy vehicle (HOV) lanes.

- ***What is the intent of HOV lanes?*** -- The High-Occupancy Vehicle (HOV) lane system is used as a strategy to maximize the people-carrying capacity of the freeways. This system has been developed with the support of the Federal Highway Administration (FHWA), and local and regional agencies. HOV lanes have been used as a viable alternative, and in most cases is the only alternative that meets the federal air quality conformity standards for capacity-increasing projects in metropolitan areas. Simply, HOV facilities represent one approach being used in the metropolitan areas of our state to respond to growing traffic congestion, declining mobility levels, air quality and environmental concerns.

- ***Why build HOV lanes?*** -- According to state law, the goal of HOV lanes is two-fold: reduce congestion and improve air quality. State law declares that HOV lanes are "to stimulate and encourage the development of ways and means of relieving traffic congestion on California highways and, at the same time, to encourage individual citizens to pool their vehicular resources and thereby conserve fuel and lessen emission of air pollutants." State and federal law also encourage the usage of buses on HOV lanes as a way to carry more people.

- ***What factors are considered when planning HOV lanes?*** -- The decision to build HOV lanes is a multi-faceted one – a decision that the California Department of Transportation (Department) makes together with the local transportation commissions and regional transportation planning agencies. Evaluated during the planning phase are existing and projected traffic volumes and occupancy rates. Factors that are considered during the development of HOV master plans include region and corridor consistency, trip patterns (origins and destinations), air quality agreements, future land use or growth, enforcement issues, as well as political and public considerations.

- ***What factors are considered when determining HOV hours of operation?*** -- Once the decision has been made to develop an HOV facility, the decision whether to operate on a part-time or on a full-time basis depends largely on the level of congestion, length of peak periods and off-peak periods, and number of peak periods in a day. Most of all, the need to maintain consistent HOV hours of operation on a corridor basis as well as a region-wide basis is required to avoid the potential for motorist confusion.

- ***Why are Northern California HOV lanes operated differently than Southern California?*** -- The Department and its partners strive to achieve uniform operation as much as possible. Recognizably, the freeway commute patterns between Northern and Southern California differ. During the 1980's and early 1990's, tests and studies were conducted by the Southern California districts and the Orange County Transportation Authority (OCTA). The study concluded that full-time operations, given the hours of congestion (typically between six to eleven hours) and short off-peak traffic hours, provided greater benefits in relieving congestion, providing rideshare incentives, and making enforcement easier. From this initial study, Southern California's HOV system has evolved into a full-time, buffer separated system. The restricted access entrances and exits provided HOV users consistently greater overall speeds, which translated to greater time savings per trip.

Conversely, Northern California commute patterns generally consist of two short definable peak commute periods (two to four hours during the mornings and evenings) separated by a long mid-day off-peak traffic period making this region conducive to part-time operation with unrestricted access. Part-time HOV lanes are separated from the adjacent mixed-flow lanes by the same broken white line or reflective marker pattern used on the majority of mixed-flow lanes. The HOV lane traffic is free to enter and exit the lane throughout the length of the facility. This unrestricted access provides optimum use of all lanes by all vehicles during off-peak hours.

- ***When is increasing HOV vehicle occupancy (i.e. from 2+ to 3+, etc.) considered?*** – If projections indicate that two person carpools will congest the HOV lane for a sustained period of time, then three person carpools are considered. The Department along with the local transportation commissions and regional transportation planning agencies decide if traffic conditions in a particular HOV facility merit consideration for an increase in occupancy requirement. All stakeholders consider the traffic impacts to the HOV corridor in question as well as impacts to adjacent freeways.

- ***How are HOV lanes monitored and evaluated****?* -- The Department closely monitors and evaluates the performance and effectiveness of all HOV lanes and adjacent mixed-flow lanes. Monitoring includes HOV and mixed-flow lane volume and occupancy counts and tachograph runs. Typically the districts conduct monitoring during the life of an HOV project, twice yearly after the first year in operation. The objective of district annual status reports is to evaluate and present the operational performance and effectiveness of existing HOV facilities. These reports discuss topics such as hours of operation, violation rates, signing, new extensions of existing facilities and comparisons of the facilities' performance with that of previous years. Peak period traffic volumes and occupancy are gathered through manual counts during the spring and fall months throughout existing facilities. The collected traffic counts are recorded in various time intervals and used to calculate existing peak hour volumes.

- ***Does the Department maintain an inventory of HOV lanes statewide?*** -- The Department compiles statewide information on HOV lanes that are existing, under construction and proposed, along with district maps. This descriptive information is available in the Department High-Occupancy Vehicle Lane Inventory Report.

- ***How are HOV lanes enforced?*** -- The Department, local agencies, and the CHP recognize the important role that public perception of how the HOV program is overseen plays with respect to the success of the state's HOV lane program. The California Highway Patrol (CHP) is responsible for HOV lane enforcement and they are an integral part of ensuring a successful HOV facility. It is currently recommended that routine enforcement be used to keep HOV violation rates less than ten percent. Experience has shown that as violation rates exceed 10 percent, public complaints increase. Once monitoring counts detect violation rates above ten percent, the district notifies local area CHP of the need for heightened enforcement in a particular HOV corridor. This systematic cooperative effort between the Department and CHP has been extremely successful in maintaining low HOV violation rates throughout the state.

- ***Does the state have a policy on the use or placement/location of HOV lanes?*** -- **Yes.** The Department will consider an HOV lane alternative for all projects which add capacity to metropolitan freeways or proposed new metropolitan freeways. The Department will work with regional transportation planning agencies in the conceptual planning phase to develop regional

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HOV lane system plans in metropolitan areas. Planning for HOV facilities is integrated into the district's system planning process through the District System Management Plan, Transportation Concept Reports and Transportation Development Plan. It also provides a linkage between system planning and the preparation of Project Study Reports. The appropriate level of planning, analysis and system development for HOV facilities must be incorporated into these documents.

- ***What is your performance measure for an HOV lane? When is it considered successful?*** -- The Department considers an HOV lane successful when a minimum of 800 vehicles per hour per lane (vphpl) or 1800 persons per hour per lane (pphpl) is achieved during the peak hour. The Federal Highway Administration allows the state at least five years from the date the HOV lane opened to achieve this threshold before investigating HOV lane conversion or other measures to improve operational efficiency and safety of the HOV lane. However, experiences in California indicate that adverse public reaction from perceived underutilization of the HOV facility is a significant factor and that a one-year period may be an appropriate goal.

  This is why the monitoring described previously on Page 2 allows for consistent evaluation of HOV lane performance by the Department and local partners. The data from the District HOV Lane Annual Reports are discussed among all stakeholders to determine HOV lane performance on a regional level whereby decisions to improve selected HOV lanes or corridors can be made.

- ***Do HOV lanes encourage the formation of new carpools?*** -- Monitoring of statewide facilities has shown increasing usage of HOV lanes throughout the years. Higher carpooling rates have been identified in those corridors that offer HOV lanes verses those that do not. Los Angeles and Orange County studies conclude that only the freeways which added HOV lanes had a significant increase in the number of carpools, compared to the other freeways which had a steady or declining number of carpools. Unless a comprehensive public survey is conducted, the exact number of those making the mode shift from the mixed-flow lanes to the HOV lanes cannot be determined. A comprehensive study of HOV lane performance in the Los Angeles region was completed in 2002 by the Los Angeles Metropolitan Transportation Authority (MTA), and quantified the mode shift impact of their HOV lane system. This study, entitled the "HOV Performance Program", concluded that over 50% of those identified as carpool lane users previously drove alone in the mixed-flow lanes prior to the carpool lane opening.

- ***Have HOV lanes ever been converted to mixed flow?*** -- If a particular facility does not seem to meet certain performance expectations, changes are discussed and considered between all stakeholders. For instance, when the Caltrans Oakland Office and the Metropolitan Transportation Commission became concerned with the performance of a short segment of HOV lane on Interstate 580 in Contra Costa County, a series of discussions were scheduled regarding the future of the lane. Following projected engineering estimates and review of air quality agreements, all stakeholders including the Federal Highway Administration agreed to convert the part-time facility to mixed, effective January 2000.

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Also during year 2000 was the conversion of HOV lanes on I-287 and I-80 in New Jersey to mixed flow. During the early 1990's when the widening of I-287 was in the design phase, from 4 lanes to 6 lanes, political pressure attributed to the two new lanes to be designated as HOV without preliminary and forecast traffic studies to assess projected usage. Subsequently, the I-287 HOV lanes were underutilized, due to insufficient feeder volumes from the predominately rural areas. The mixed-flow lanes were relatively free-flow aside from bottleneck at the few existing interchanges. In light of the huge public outcry that followed, the media focused on these bottleneck areas, rather than on the entire route. Rather than fix those isolated areas, the quicker, easier fix was to convert the HOV lanes to mixed-flow. In this case, the federal funds obtained to construct the lanes came from Section 340 of the 1999 Omnibus Appropriations Act which waived repayment of funds if the state could prove that the HOV lanes have not succeeded in their original mission to improve air quality and reduce congestion. Very few lanes were constructed with funds from this Omnibus Act.

- ***Why invest in public information of HOV lanes****?* -- The public wants the Department to be more involved in a truly multi-modal system that includes alternate transportation options, mass transit and interconnectivity between modes. Also, the Department is continuously asked to provide information describing how projects affect local communities.

- ***What are HOT Lanes?*** – High-occupancy toll lanes (HOT Lanes) provide free passage for qualified carpools and require tolls for all other vehicles. State and/ or Federal legislation is required for a toll system, such as HOT lanes. Strong public support must also exist to support a toll road, and the higher project and administrative costs to the project for toll collection facilities must be included in the economic analysis of alternatives. Barriers are required between HOT lanes and mixed-flow lanes to separate the lanes and minimize violations. A larger project right-of-way footprint is required to accommodate HOT lanes and the toll collection stations. Ingress/egress points (openings in the barrier) must be provided to allow vehicles into the HOT lanes where demand exists and operations are not impacted. Peak and off-peak demand must be determined to decide operational hours of the HOT lanes.

- ***What are Reversible Flow HOV Lanes?*** – Reversible flow is an operational mode where the HOV lanes operate in one direction during the AM peak period and change to the opposite direction during the PM peak period. This type of operation is feasible only if the existing and forecast peak period directional traffic split is 30% or less in one direction during the design life of the project. US-50 directional traffic split is closer to 50%, thus making this option not feasible from an operations standpoint.